T. limula, Hilgendorf, from Senegambia, the postfrontal crest is less distinctly developed near the lateral epibranchial teeth, behind which, in the males, are indications of two other teeth.

7. On the Heart described by Professor Owen in 1841 as that of *Apteryx*. By E. Ray Lankester, M.A., LL.D., F.R.S., Jodrell Professor of Zoology in University College, London, Fellow of Exeter College, Oxford.

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When busy some three years ago with the examination of the right cardiac valve of *Ornithorhynchus* and *Echidna*, I was naturally anxious to examine the similar valve of *Apteryx*, which had been stated by Sir Richard Owen to present a divergence from the character which it usually presents in Birds, and instead of being purely muscular as in all other Birds, to possess membranous areæ and chordæ tendineæ. Sir Richard Owen gives the following account of this valve in his paper published in 1841, in the 'Transactions' of this Society (vol. ii. p. 272):—

"The principal deviation from the ornithic type of the structure of the heart is presented in the valve at the entry into the right ventricle (pl. lii. *g*. fig. 3). This is characterized in birds by its muscularity and its free semilunar margin. In the *Apteryx* it is relatively thinner, and in some parts semitransparent and nearly membranous; a process moreover extends from the middle of its free margin, which process is attached by two or three short *chordæ tendineæ* to the angle between the free and fixed *parietes* of the ventricle. We perceive in this mode of connection an approach in the present bird to the mammalian type of structure analogous to that which the *Ornithorhynchus*, among *Mammalia*, offers, in the structure of the same part, to the class of birds; for the right auricular ventricular valve in the *Ornithorhynchus* is partly fleshy and partly membranous. The dilatable or free *parietes* of the right ventricle were about $\frac{1}{20}$th of an inch in thickness, those of the left were $\frac{1}{6}$th of an inch thick."

I was fortunately able to gratify my curiosity with regard to the heart of *Apteryx* by the dissection of a specimen preserved in spirit, which I owe to the courtesy of Mr. Cheeseman.

I was not a little astonished to find that the right cardiac valve of my *Apteryx* was totally different from that described by Owen, and so far from presenting any membrane or chordæ tendineæ, exhibited the normal structure of the right cardiac valve in birds; in fact was a purely muscular lobe. I put the matter by at that time, and was reminded of it a few weeks since by Mr. Beddard, who told me that he had obtained a precisely similar result to my own from the examination of a specimen of *Apteryx* which had recently come into his possession.

Mr. Beddard further told me that he had taken an opportunity

of looking at Owen's specimen of the heart of *Apteryx*, which is now in the Museum of the Royal College of Surgeons, No. 923 B. b. and that it certainly differed altogether, as regards its right cardiac valve, from an ordinary bird's heart, and from the *Apteryx*-heart dissected by him. Mr. Beddard remarked, as Owen had done himself, that the valve in this specimen in the College of Surgeons was very similar to the right cardiac valve of the Monotremata.

It occurred to me that possibly Sir Richard Owen had made an unfortunate mistake at the time of dissecting his *Apteryx*, and that since he had at the same time specimens of *Ornithorhynchus* under examination, side by side with the *Apteryx*, the heart of one of the latter might, by the inadvertency of some assistant or attendant, have been exchanged for the heart of the former.

Accordingly on Feb. 18th I requested Prof. Charles Stewart to allow me to remove from its bottle, and closely examine the specimen 923 B. b., labelled "Heart of *Apteryx australis*" (so placed and labelled, so far as I have been able to ascertain by inquiry, under the direction of Prof. Owen).

The figure in the Society's 'Transactions' does not represent the appearance of this heart, inasmuch as three musculi papillares are figured, and are described as "chordæ tendineæ," whilst only two (the great anterior and the right) are obvious in the preparation. That is, however, a matter of detail which Prof. Owen regarded as liable to variation, since he says that two *or* three chordæ tendineæ are present, and in his paper on *Apteryx* he speaks of having dissected *two* specimens.

On removing the heart from the bottle in Prof. Stewart's presence, I was able to point out to him that the aortic arch of this supposed heart of *Apteryx* has a *sinistral* and *not* a *dextral* flexure. I also found that the auricles and the relatively small jugular sinus are identical with that of *Ornithorhynchus*, and unlike the auricles and large veinous sinus of any bird. I found, further, that the arrangement of muscle and membrane in the right cardiac valve is precisely (not only approximately) similar to that described by me in *Ornithorhynchus*, and figured in the 'Proceedings' of the Society for 1882, pl. xl., and also in 1883, pl. iii.

The shape of the whole heart, the shape of the right ventricular cavity, and the markings of its surface (rudimentary columnæ carneæ) are precisely of the same character as in the nine specimens of *Ornithorhynchus*-hearts examined by me.

I have no hesitation in stating that the heart, specimen No. 923 B. b., in the Museum of the Royal College of Surgeons, is *not* the heart of an *Apteryx*, but the heart of an *Ornithorhynchus paradoxus*.

This being the case, the discrepancy between the observations made independently by Mr. Beddard and by me upon the structure of the right cardiac valve of *Apteryx*, when compared with the statements made forty years ago by Sir Richard Owen, is accounted for. Sir Richard Owen did not examine the heart of *Apteryx*, but by an accident occupied himself with the heart of an *Ornithorhynchus* which he mistook for the heart of that bird.